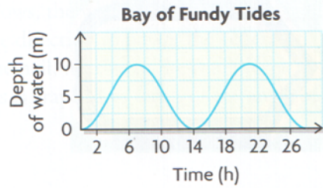


### 5.3 Graphs of Sinusoidal Functions

Ex 1:



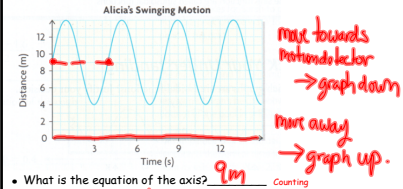
State the following for the function at the right:

- a) period 14 h
- b) max value 10m
- c) min value 0m
- d) equation of the axis  $d = 5$
- e) amplitude  $a = 5$

Apr 12-2:27 PM

Ex 2:

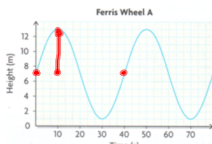
Alicia was swinging back and forth in front of a motion detector. Her distance from the detector was modeled by the following graph:



- What is the equation of the axis? 9m  
Algebraically:  $d = \frac{\text{max} + \text{min}}{2}$  Counting
  - What is the amplitude? 3m  
Algebraically:  $a = \frac{\text{max} - \text{min}}{2}$  Counting
  - What is the period of the function? approx 4 sec
  - How close did Alicia get to the motion detector? 4m
  - At  $t = 8$  sec would it be safe to run between Alicia and the motion detector?  
yes because she is moving away from the detector and is approx 1m away.
- Note: Always safe at anytime because she is never closer than 4m.

Apr 12-2:28 PM

Ex 3:



- What is the period of the function? 20 sec
- Maximum 13m Minimum 1m
- What is the equation of the axis?  $h = 7$
- What is the amplitude? 6m (radius)
- Determine the circumference of the Ferris Wheel:  
 $= 2\pi(6)$   
 $= 37.7m$   $= 37.7$
- Determine the speed of the Ferris Wheel:  
 $= \frac{37.7m}{40 \text{ sec}}$   
 $= 0.94m/sec$

Apr 12-2:33 PM

Ex 4: Comparing Functions

~~Ferris Wheel A and Ferris Wheel B have the same radius but Ferris Wheel B has a different height. At its lowest point, Ferris Wheel B is 1m above the ground. On this ride, the height of a passenger car reaches 15m. On the same grid, sketch the height of a passenger above the ground for two complete revolutions of both Ferris Wheels.~~

a) On the same grid, sketch the height of a passenger above the ground for two complete revolutions of both Ferris Wheels.

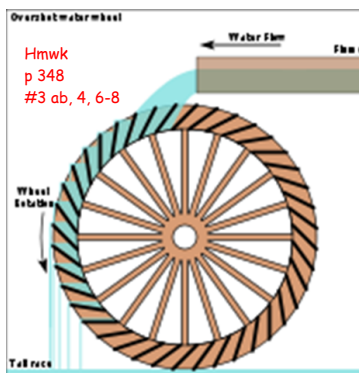
b) Compare the curves:

Property	20m wheel	15m wheel
Period		
Amplitude		
Equation of the axis		
Range		
Speed of the wheel		

Communication:

- How does changing the radius of the wheel affect the sinusoidal graph?
- How does changing the height of the axis of the wheel affect the sinusoidal graph?
- How does changing the speed of the wheel affect the sinusoidal graph?

Nov 9-3:11 PM



Hmwk  
p 348  
#3 ab, 4, 6-8

Apr 12-4:04 PM